

Remarks/Arguments:

Claims 1-9, 12, 16-20, 22-27, 30, 35, 37, 38, 40, and 47-70 are currently pending.

Claims 37, 38, 40, 47, and 56-70

Applicant thanks the Patent Office for its indication that claims 37, 38, 40, 47, and 56-70 are allowed. However, Applicant believes that all pending claims are in condition for allowance.

35 U.S.C. 103(a) rejection

The Patent Office rejected claims 1-9, 12, 16-20, 22-27, 30, 35, and 48-55 under 35 U.S.C. 103(a) as being unpatentable over Wang, U.S. Patent No. 6,990,453, in view of Rhoads, U.S. Patent No. 7,185,201.

In Applicant's invention, as supported by paragraph 0050, there are an apparatus and a remote service that are configured to perform distributed feature extraction, wherein the apparatus is configured to perform lower level but not higher level feature extraction and the remote service is configured to perform any needed higher level feature extraction from extracted lower level features transmitted by the apparatus to identify the media from which the lower level features have been extracted. Independent claims 1, 23, 48, and 50 are directed to an apparatus or a method that performs lower level but not higher level feature extraction.

Claim 1, as an example of the claimed invention, recites as follows:

An apparatus comprising: an interface configured to receive a media sample; a processor configured to extract a first set of lower level but not higher level features from a digital version of the media sample; a transmitter configured to transmit the extracted first set of lower level but not higher level features over a wireless communication link, a receiver configured to receive over the wireless communication link a request message that requests at least one additional feature; wherein the processor is further configured to respond to the request message to extract a second set of lower level but not higher level features from the digital version of the media sample and to transmit the extracted second set of lower level but not higher level features over the wireless communication link to a remote service for any necessary higher level feature extraction for matching in conjunction with the first and second sets of lower level features, wherein the receiver is configured to receive notification

as to identification of a media corresponding to the media sample from the remote service.

In Wang, landmarks and fingerprints are used to build a database 18. A media sample is captured 12 (Figure 1). Landmarks and fingerprints from the exogenous media sample are computed 14 and matched 16 through use of the database 18. Correspondences are generated 20 and a winning media sample file is located 22.

Wang discloses a sound source continually sampled into a buffer (column 21, lines 64-67). Sound parameters may be extracted from a sound buffer into fingerprints or other intermediate feature-extracted forms and stored in a second buffer (column 22, lines 19-21). New fingerprints may be added to the front of the second buffer while old fingerprints are discarded from the end of the buffer to form a rolling buffer (column 22, lines 22-24).

The method of Wang involves a search first performed on a first subset of sound files and only if the first search fails, then a search of second subset of sound files is performed (column 19, lines 23-34). **Wang's method does not involve requesting the mobile station to provide a second set of features and does not appear amenable to modification to request a second set of features from the mobile station since the method of Wang involves a first search of highly used sound files only to be followed by a second search of less highly used sound files.** Wang does not contemplate a request for a second set of features, as evidenced by Figure 1, in which Wang finds matching fingerprints 16 and then generates correspondences 20 with sample landmarks to find a winning sound file 22.

Furthermore, **Wang does not teach an apparatus configured to extract lower level features that may be later used by a separate remote device to extract higher level features off-apparatus to identify a media from a media sample**, and does not teach a remote service configured to identify from received lower level features and configured to extract higher level features from the received lower level features to uniquely identify a media corresponding to the media sample. Wang, in column 8, lines 13-24, discloses as follows:

The client end sends a feature-extracted summary of the captured signal sample containing landmark and fingerprint pairs to the server end, which performs the recognition. Sending this feature-extracted summary to the server, instead of the raw captured signal, is advantageous because the amount of data is greatly reduced, often by a factor of 500 or more. Such

information can be sent in real time over a low-bandwidth side channel along with or instead of, e.g., an audio stream transmitted to the server. This enables performing the invention over public communications networks, which offer relatively small-sized bandwidths to each user.

In Wang, the feature extraction is disclosed as occurring in the client device and the recognition occurs in the server. The computational nodes referenced in column 15, lines 12-14, in Wang correspond to the client side of Wang's system. On the server side, Wang, from column 15, line 59, through column 18, line 50, the extracted features are used to rank candidates; no features are extracted from these features received from the client device.

Claims 1, 23, 48, and 50 recite, identically or similarly, as follows: "the extracted second set of lower level but not higher level features over the wireless communication link to a remote service for any necessary higher level feature extraction for matching in conjunction with the first and second sets of lower level features."

Wang does not teach or suggested this claimed subject matter.

The Patent Office asserted on pages 3-4 of the Final Office Action dated May 21, 2009, as follows:

Wang differs from the claimed invention by not explicitly reciting the receiver is for receiving a request message over the wireless link that requests at least one additional feature and the processor is automatically responsive to the request message to extract a second set of features from the digital version of the media sample and the transmitter is further to transmit the extracted second set of lower level but not higher level features for any necessary higher level feature extraction for matching in conjunction with the first and second sets of lower level features.

In an analogous art, Rhoads teaches a system for identifying audio samples (Abstract and Col. 3 lines 17-25) that includes the ability to extract multiple fingerprints from a file in order to resolve ambiguity (Col. 3 lines 22-25) with the additional ability to combine multiple fingerprints into a higher level fingerprint. (Col. 3 lines 6-13 "master fingerprint") At the time the invention was made, it would have been obvious to one of ordinary skill in the art to implement the mobile station of Wang after modifying it to incorporate the ability to increase resolution to resolve ambiguity of Rhoads. One of ordinary skill in the art would have been motivated to do this since it enables back and forth communication to resolve ambiguity and to ensure a matching file. (Rhoads Col. 3 lines 22-25)

Rhoads, in column 3, lines 1-25, discloses as follows:

Some fingerprinting algorithms consider the entire audio track (e.g., 3 minutes). Others work on much shorter windows--a few seconds, or fractions of seconds. The former technique yields a single fingerprint for the track. **The latter yields plural fingerprints--one from each excerpt. (The latter fingerprints can be concatenated, or otherwise combined, to yield a master fingerprint for the entire audio track.)** For compressed audio, one convenient unit from which excerpts can be formed is the frame or window used in the compression algorithm (e.g., the excerpt can be one frame, five frames, etc.).

One advantage to the excerpt-based techniques is that a song can be correctly identified even if it is truncated. Moreover, the technique is well suited for use with streaming media (in which the entire song data is typically not available all at once as a single file).

In database look-up systems employing fingerprints from short excerpts, a first fingerprint may be found to match 10 songs. **To resolve this ambiguity, subsequent excerpt-fingerprints can be checked.**

Rhoads, in column 3, lines 1-25, does not disclose or suggest extracting **“a first set of lower level but not higher level features from a digital version of the media sample.”** Rhoads in this passage discloses that fingerprints may be concatenated; however, concatenation does not correspond to a higher level and lower level extraction feature. Concatenation does not correspond to extraction.

Rhoads, in column 3, lines 1-25, does not disclose receiving **“a request message that requests at least one additional feature.”** Rhoads, in the cited passage, discloses a database look-up system and the checking of subsequent excerpt-fingerprints to resolve ambiguities, but does not disclose a request message that requests at least one additional feature. Of course, because there is no disclosed or suggest request message, Rhoads does not disclose or suggest responding to such.

Rhoads, in column 3, lines 1-25, does not disclose **“a remote service for any necessary higher level feature extraction for matching in conjunction with the first and second sets of lower level features.”** Although Rhoads, in this passage, discloses a database look-up system, this is not disclosed as being a remote service. Furthermore, Rhoads does not disclose or suggest a service for **“any necessary higher level feature extraction for matching in conjunction with the first and second sets of lower level features.”**

Because neither Wang nor Rhoads disclose or suggest extracting **“a first set of lower level but not higher level features from a digital version of the media sample,”** receiving **“a request message that requests at least one additional feature,”** or **“a**

remote service for any necessary higher level feature extraction for matching in conjunction with the first and second sets of lower level features,” no purported combination of these two references would disclose or suggest this claimed subject matter.

Also, it is noteworthy that, Wang and Rhoads disclose all feature extraction occurs on the client end. That is, there is no distributed feature extraction as in each and every one of the pending independent claims.

Thus, claims 1-9, 12, 16-20, 22-27, 30, 35, and 48-55 are not made obvious by Wang in view of Rhoads.

The Patent Office rejected claims 18-20 under 35 U.S.C. 103(a) as being unpatentable over Wang, U.S. Patent No. 6,990,453, in view of Rhoads, U.S. No. 7,185,201, and Vetro, U.S. Patent No. 6,490,320.

The above discussion of Wang and Rhoads applies here.

Vetro is apparently cited by the Patent Office for a teaching of high-level description schemes (col. 4, lines 44-46) in addition to a low-level representation (col. 4, lines 34-38) and SummaryDS (col. 22, lines 30-33). Vetro relates to “delivery systems that adapt information to available bit rates of a network” (col. 1, lines 15-17).

The relevance of Vetro is not understood in light of the currently pending claims. Any higher level features derived by Vetro are passed on as content information CI 302 to the CND manager 330 (column 8, line 60, through column 9, line 9) which is used to determine an optimal transcoding strategy for switchable transcoder 340.

Vetro, like Wang and Rhoads, does not teach “the extracted second set of lower level but not higher level features over the wireless communication link to a remote service for any necessary higher level feature extraction for matching in conjunction with the first and second sets of lower level features.”

Thus, claims 18-20 are allowable over these three references, alone or in combination.

The Patent Office is respectfully requested to reconsider and remove the rejections of the claims under 35 U.S.C. 103(a) based on Wang, Rhoads, and Vetro, alone or in combination, and to allow all of the pending claims 1-9, 12, 16-20, 22-27, 30, 35, 37, 38, 40, and 47-70 as now presented for examination. An early notification of the allowability of claims 1-9, 12, 16-20, 22-27, 30, 35, 37, 38, 40, and 47-70 is earnestly solicited.

Respectfully submitted:

Walter J. Malinowski
Walter J. Malinowski
Reg. No.: 43,423

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Date

Customer No.: 29683
HARRINGTON & SMITH, PC
4 Research Drive
Shelton, CT 06484-6212

Phone: (203) 925-9400, extension 19
Email: wmalinowski@hspatent.com
Facsimile: (203) 944-0245

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